Volume 6 1964-1965

STATE OF ALASKA

William A. Egan, Governor

ANNUAL REPORT OF PROGRESS, 1964 - 1965

FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-6

SPORT FISH INVESTIGATIONS OF ALASKA

ALASKA DEPARTMENT OF FISH AND GAME
Walter Kirkness, Commissioner

E. S. Marvich, Deputy Commissioner

Alex H. McRea, Director
Sport Fish Division

Louis S. Bandirola, Coordinator

INTRODUCTION

This report of progress consists of Job Segment Reports from the State of Alaska Federal Aid in Fish Restoration Project F-5-R-6, "Sport Fish Investigations of Alaska."

The project during this report period is composed of 23 separate studies designed to evaluate the various aspects of the State's recreational fishery resources. Of these, eight jobs are designed to pursue the cataloging and inventory of the numerous State waters in an attempt to index the potential recreational fisheries. Four jobs are designed for collection of specific sport fisheries creel census while the remainder of the jobs are more specific in nature. These include independent studies on king salmon, silver salmon, grayling, Dolly Varden, a statewide access evaluation program and an egg take program.

A report concerning the residual effects of toxaphene accumulates the findings of a three-year study. The report presented here terminates this segment and is a final report. The information gathered from the combined studies will provide the necessary background data for a better understanding of local management problems and will assist in the development of future investigational studies.

The subject matter contained within these reports is often fragmentary in nature. The findings may not be conclusive and the interpretations contained therein are subject to re-evaluation as the work progresses.

Volume 6 Report No. 15-A

JOB COMPLETION REPORT

RESEARCH PROJECT SEGMENT

STATE: ALASKA Name: Sport Fish Investigations of Alaska.

Project No.: F-5-R-6 Title: Inventory and Cataloging of the Sport Fish and Sport Fish Waters in the Interior of Alaska.

Job No.: 15-A

Period Covered: July 1, 1964 to June 30, 1965.

ABSTRACT

During the reporting period, 23 lakes were surveyed and their fish populations were investigated. Twelve currently stocked and managed lakes were also test-netted for population samples to assist in determination of future management policies. Seventeen lakes were tested for winter dissolved oxygen levels.

Survey activity was emphasized in areas adjacent to the existing and planned road systems and population centers. A trip to the Central Brooks Range region was made to assess existing fish populations and to determine the importance of the Brooks Range lakes for present and future "fly-in" fisheries.

The Salcha River creel census program was operated by Fairbanks Fish and Game personnel, and the catch results were analyzed.

Creel census from the Unalakleet River military sport fishing camps is compiled and discussed.

Preliminary investigation of Interior Alaska sheefish stocks along with initial experiments in capturing, handling and tagging were successfully accomplished.

RECOMMENDATIONS

It is recommended that:

1. Inventory and cataloging of Interior Alaska waters be continued on both the accessible and remote fly-in fisheries and that preliminary surveys be initiated in the Nome-Teller area.

2. Annual test netting of stocked lakes be continued to provide the up-to-date information

necessary for maintenance of optimum fishery levels.

3. A second transplant of adult lake trout be made into Harding Lake to supplement the 1963 stocking.

4. A source of grayling eggs for hatching and rearing be be located in an area free of intensive angling.

5. Survey of salmon runs in the Tanana River tributaries be continued to determine run magnitude and timing.

6. Undesirable fish populations in Birch and Little Lakes be eradicated, and that these lakes be restocked with desirable game species.

7. Investigation of Interior Alaska sheefish stocks be continued.

8. Survey work and creel census programs be continued on both the Salcha River and Tangle Lakes to provide information on grayling stocks currently subjected to intensive angling pressure.

OBJECTIVES

1. To assess the environmental characteristics of the existing and potential fishery waters of the job area and, where practicable, to obtain estimates of existing or potential angler use and sport fish harvest.

2. To evaluate our application of fishery restoration measures and to determine the availability of sport fish egg sources.

3. To assist as required in the investigation of public access status to the area's fishing waters.

4. To evaluate multiple water use development projects (public and private) and their effects on the area's streams and lakes for the proper protection of the sport fish resources.

TECHNIQUES USED

Stocked waters and those with undetermined fish populations were test-netted for population samples. Growth rates, abundance and general condition of fish were evaluated and considered when making future stocking and management recommendations.

Physical surveys were conducted on waters, by standard acceptable methods, to determine depths, spawning areas, bottom types, temperatures and related information.

All waters were assessed for potential sport fish value, and areas warranting public access facilities were recorded and forwarded to Department access biologists for action. Inaccessible waters were reached by float plane or by walking.

Creel census information from the Unalakleet military fishing camps was forwarded by respective camp supervisors to the Fairbanks Fish and Game office. Data has been compiled and is discussed.

Capture and experimental tagging of Holitna River sheefish was accomplished by hook and line. Gillnet sets were unsuccessful.

Aerial observations of Tanana River salmon runs were continued for enumeration and run timing.

FINDINGS

Salcha River Fishery

The Salcha River creel census program was conducted again in 1964 to continue assessment of sport fishing impact on king and chum salmon runs and to provide data to compare with that collected in 1963. The station operated from July 21 to August 16, a period coincident with both king and chum salmon migrations.

A total of 409 anglers fished 2,080 hours for a catch of 5 kings, 38 chums, and 1,175 grayling. The catch per hour was .16 and .64 for salmon and grayling, respectively. The 1964 catch of salmon was smaller than that of 1963; however, successful angling was precluded for two brief periods during migration due to high water conditions.

The grayling catch was approximately the same in 1964 as in the previous year and again, as in 1963, this species was the highest contributor to the overall angler catch. The figures presented in Table 1 indicate that approximately 85 percent of the anglers participating in the Salcha River fishery were actually fishing for grayling. A continued creel census is needed to determine changes in the grayling population size and density being brought about by increased angling pressure.

It appears that the effect of sport fishing on existing Salcha River salmon runs, in terms of fish taken, is relatively insignificant. The grayling fishery, however, provides excellent angling to the Fairbanks area sportsman.

TABLE 1. - Salcha River Creel Census, July 21 to August 16

Year	No.of Anglers	No.of Kings	No.of Chums	No.of Grayling	Hrs.Angled for Salmon	Hrs.Angled for Grayling	Salmon Per Hour	Grayling Per Hour
1964	409	5	38	1175	264	1816	.16	.64
1963	275	24	65	1294	(2,052* Angler Hours, all species)			

Angler Composition

Year	Civilian		Military
	Resident	Non-Resident	
1964	220	22	167
1963	121	46	108

* Angler hours for individual species unrecorded.

Unalakleet River Military Fishing Camps

Locations and facilities of both the Eielson AFB and Fort Wainwright sport fishing camps are discussed in the 1963-1964 progress report (Job 13-A). The 1964 operation was similar to that of the previous year.

A total of 359 anglers utilized both Unalakleet sport fishing camps and fished 6,486 hours for salmon, grayling, Dolly Varden and whitefish. Average salmon catch per angler for a three-day trip was 3.8 at the Ft. Wainwright camp, and 4.6 at Eielson. Complete catch data is shown in Table 2.

Creel census forms were completed by the military angler and forwarded by the respective camp supervisors to the Fairbanks office every week to ten days. As in the past, a number of forms were incomplete and indicated a general indifference by responsible camp personnel. The greatest deficiencies appeared to occur in the recorded lengths and weights of fish taken.

Figures shown in Table 2 may not indicate the total catch but are believed to be within 25 percent of the true angler take.

Sheefish Investigations

Preliminary observations of the Sleetmute area sheefish stocks were made. Attempts were made to locate areas of sheefish concentration and spawning in the Holitna and Hoholitna Rivers and to experimentally tag a number of fish to determine techniques and effects.

Sheefish become available to the angler immediately upon ice break-up in the spring and are present in large numbers throughout the summer. During this period, the largest concentration appears to be at the mouth of the Holitna River, immediately above the village of Sleetmute.

Sheefish are quite susceptible to angling in these concentration areas, which appear to remain predictable from year to year. Popularity of sheefish angling is increasing because of the fish's size, sporting and table qualities and its occurrence in large numbers.

Eleven sheefish were experimentally tagged with Petersen discs to determine the effects of handling and tagging. The fish were taken by hook and line, weighed, measured, tagged and released, all in apparent good condition. No immediate mortality occurred and no serious problem is expected to develop in future tagging of sheefish.

TABLE 2. - Creel Census Summary of Unalakleet River Military Sport Fishing Camps

	Ft. Wainwright	Eielson A.F.B.
Total Anglers	209	150
Days Camp Operated	105	69
Total Angler Hours	2263	4223
Total Salmon Catch	795	692
Total Fish Catch	1483	1895
Chum	158	85
King	4	39
Silver	98	204
Pink	535	364
Dolly	375	806
Grayling	267	340
Whitefish	46	57
Salmon per Angler	3.8	4.6
Fish per Angler*	7.0	12.6

* Includes all fish species.

Length-Weight Sample of Unalakleet River Sport-Caught Salmon

	Average Length in Inches	Average Weight in Pounds
Chum	23.1	6.1
King	27.0	13.3
Silver	24.7	6.4
Pink	15.5	2.4

Future Holitna River work will include tagging to determine the extent and patterns of migration, determination of spawning areas and reasons for the high midsummer concentrations.

Fish Stocking Evaluations

Twelve lakes were test-netted for population analysis and to evaluate the success of the present stocking program. These stocked and currently managed lakes are presented in Table 4. Growth of both rainbow and silver salmon was satisfactory in all except two lakes, where no fish were recovered.

No trout were taken by gill net in either Little Lake or Sergeant's Pond. It is suspected that reinfestation of northern pike in Little Lake has occurred and that there is insufficient productivity in Sergeant's Pond.

Comparative growth of silver salmon and rainbow in the Interior lakes is nearly identical at the end of the first year, with lengths averaging approximately 6.5 to 7.0 inches. Second-year lengths remain quite similar, 10 to 12 inches; however, the rainbow develop the characteristic robust body shape and are slightly heavier.

The silvers, although not of trophy proportions, appear to comprise at least 50 percent of the overall summer bag; and possibly 80 to 90 percent of the winter ice-fishing catch.

Both silver salmon and rainbow are well-accepted by the sportsman; the silver for his voraciousness and the rainbow for his size. Together, they make a very acceptable fish population for the Interior Alaska sportsman.

Lake Surveys

Twelve lakes, located in the Denali highway and Big Delta area, received initial lake surveys and were test-netted for fish population composition.

A number of remote lakes in the Central Brooks Range region were also cursorily examined and will be discussed later in the text.

Names and locations of all surveyed waters are given in Table 3, and gill net sample data is presented in Table 4. Complete survey data for each body of water is on file in the Fairbanks Fish and Game office.

Tangle Lake Area

Survey work on the Tangle Lake system was initiated, and four of the seven major lakes comprising this complex were

TABLE 3. - Lakes Surveyed 1964-1965

Name	Location	Latitude	Longitude
Little Lake	44 Mi. So. of Fairbanks	64°20'40"	146°54'
Mark Lake	Bolio Lk. Rd. - Ft. Greely	63°51'30"	145°51'30"
Sergeant's Pond	Ft. Wainwright	64°49'30"	147°35'
West Craig Lake	W. of Craig Lk. - Alaska Hwy.	63°44'	144°43'
Lost Lake	W. of Quartz Lk. - Rich. Hwy.	64°12'	145°51'
Chet Lake	Donnelly Dome Area	63°49'40"	149°50'15"
Nickel Lake	Donnelly Dome Area	63°49'40"	149°50'45"
"J" Lake	Donnelly Dome Area	63°50'	149°50'
Volkmar Lake	20 Mi. E. of Delta Jct.	64°07'	145°11'
Fielding Lake	Isabel Pass - Rich. Hwy.	63°10'30"	145°42'
Tangle Lake, Long	Denali Hwy. - 22 Mile	63°04'	145°48'
Tangle Lake, Round	Denali Hwy. - 22 Mile	63°03'	146°00'
Tangle Lake, #1	Denali Hwy. - 22 Mile	63°02'	146°04'
Tangle Lake, Upper	Denali Hwy. - 22 Mile	63°10'30"	146°03'
Fish Lake	Central Brooks Range	68°10'	152°44'
Chandler Lake	Central Brooks Range	68°14'	152°42'
L. Chandler Lake	Central Brooks Range	68°17'	152°41'
Round Lake	Central Brooks Range	68°20'	152°35'
Shainin Lake	Central Brooks Range	68°21'	151°04'
Nanushuk Lake	Central Brooks Range	68°21'	150°37'
Walker Lake	Central Brooks Range	67°07'	154°22'
Iniakuk Lake	Central Brooks Range	67°08'	153°12'
Helpmejack Lake	Central Brooks Range	66°56'	153°34'

TABLE 4. - Test Netting 1964-65

Name	Date	Number	Species	Length Range	Length Mean	Frequency*	% Comp.
Little Lake**	6-9-63	6	NP	11.0-13.3	11.6	.18	100.0
	7-1-64	8	NP	8.5-17.1	12.8	.22	100.0
81 Mile Lake**	6-10-64	3	Rb	7.2- 9.7	8.1	.10	100.0
Lost Lake (Quartz)	6-11-64	No Fish					
	7-2-64	No Fish					
Birch Lake	6-12-64	26	NP	15.0-27.2	19.6	.54	63.4
		15	WF	9.3-19.0	14.6	.31	36.6
Mark Lake**	6-16-64	No Fish					
Bolio Lake**	6-16-64	6	Rb	8.7-18.5	13.1	.13	12.2
		43	SS	5.0-13.3	9.6	.93	87.8
Lost Lake (Birch)**	6-10-64	1	SS	7.6	7.6	.01	10.0
		9	Su	6.0- 7.7	6.9	.08	90.0
	6-17-64	5	SS	6.5- 7.0	6.6	.04	71.4
		2	Su	6.0- 8.8	7.4	.01	28.6
	6-18-64	14	SS	5.8- 7.2	6.4	.14	100.0
Nickel Lake	6-17-64	7	Su	6.0- 8.4	7.6	.38	100.0
Chet Lake	6-17-64	39	Su	6.4-14.4	9.1	1.14	45.9
		46	Gr	7.6-13.4	8.5	1.35	54.1
"J" Lake	6-17-64	6	Su	5.9-10.3	7.6	.18	35.3
		11	Gr	6.5-10.5	8.9	.33	64.7
Sergeant's Pond**	6-19-64	No Fish					
	10-6-64	No Fish					
Donna Lake**	6-23-64	23	Rb	9.3-13.4	11.8	.63	100.0

TABLE 4 (Cont.). - Test Netting 1964-65

Name	Date	Number	Species	Length Range	Length Mean	Frequency*	% Comp.
Little Donna Lake**	6-23-64	1	SS	6.1	6.1	.02	16.6
		5	Rb	4.6- 6.0	5.5	.13	83.4
Jan Lake**	6-25-64	39	Rb	6.7-17.2	9.6	1.14	63.9
		22	SS	5.0- 5.6	5.4	.64	36.1
Lisa Lake**	6-25-64	8	Rb	10.5-14.5	12.9	.21	100.0
Craig Lake**	6-25-64	5	Rb	7.4-10.9	8.8	.27	38.5
		8	SS	4.1- 4.9	4.6	.44	61.5
	6-26-64	1	Rb	8.5	8.5	.06	100.0
	7-7-64	3	Rb	8.1-10.6	9.2	.09	100.0
Craig Lake #1	6-26-64	No Fish					
Quartz Lake	7-21-64	23	NP	8.0-26.5	13.7	.67	46.0
		27	WF	6.5-14.0	10.7	.79	54.0
Volkmar Lake	8-10-64	4	NP	12.0-25.0	20.3	.13	16.7
		20	WF	12.3-14.8	13.9	.66	83.3
Fielding Lake	8-22-64	16	LT	14.1-26.8	18.6	.14	8.1
		7	LC	10.0-22.4	15.8	.06	3.6
		9	Gr	9.3-16.6	12.6	.07	4.6
		164	RWF	8.2-13.5	11.7	1.43	83.7
Tangle Lake (Long)	8-25-64	3	LT	8.0-16.4	11.8	.07	3.7
		2	LC	10.7-11.4	11.0	.05	2.5
		10	Gr	8.0-13.8	9.7	.26	12.5
		65	RWF	7.3-13.3	11.0	1.71	81.3
Tangle Lake (Round)	7-16-64	14	LT	8.9-14.0	12.4	.58	23.0
		6	Gr	10.6-13.3	12.1	.25	9.8
		41	RWF	9.7-14.5	11.5	1.70	67.2

TABLE 4 (Cont.). - Test Netting 1964-65

Name	Date	Number	Species	Length Range	Length Mean	Frequency*	% Comp.
Tangle Lake (#1)	8-24-64	4	LT	9.7-21.8	15.7	.06	2.6
		48	Gr	8.8-16.3	13.0	.73	32.0
		1	LC	13.7	13.7	.01	.7
		97	RWF	7.7-15.1	11.6	1.49	64.7
Tangle Lake (Upper-Landlocked)	8-27-64	26	LT	11.8-18.5	14.5	.61	50.9
		25	RWF	8.4-12.0	10.3	.59	49.1
Wainwright Pond**	9-1-64	5	Rb	9.1-12.3	11.3	.20	100.0
Harding Lake	9-1-64	10	NP	14.0-32.0	18.3	.08	66.7
		5	LT	18.8-30.2	25.6	.04	33.3
	10-13-64	4	NP	19.6-33.0	23.3	.08	40.0
		6	Ci	7.4-11.6	8.6	.12	60.0

* Number of fish per hour in 125' experimental gill net.

** Stocked lakes.

NP - Northern Pike
SS - Silver Salmon
Rb - Rainbow
LT - Lake Trout
LC - Ling Cod
WF - Whitefish
RWF - Round Whitefish
Ci - Cisco
Su - Sucker
Gr - Grayling

completed. The lake system is approximately 20 miles long, possesses approximately 70 miles of tributary streams and totals nearly 1,750 surface acres of water.

The central lakes in the system, Round Tangle and Number 1 Tangle, are accessible from the Denali Highway. Two additional lakes are easily accessible by boat, as are the remaining lakes if short portages are made.

The more accessible lakes, Round, Number 1 and Long Tangle, are presently receiving intensive angling pressure, while the remaining lakes remain relatively lightly fished. Gillnet sampling indicated an upward size gradient from the lower portion of the system to the upper. Continued survey of the Tangle Lake area is planned to determine if this size gradient is a result of angling pressure, seasonal movement or an unknown migrational pattern.

Big Delta Area

Eight lakes, which are loosely grouped into the "Delta Area," were surveyed and test-netted for a fish population sample.

Three of these lakes, Chet, "J" and Nickel, are located on the Ft. Greely military reservation. They have a satisfactory indigenous population of grayling and are supporting considerable fishing pressure from military personnel. Until the time fishing pressure makes the supplementing of natural stocks necessary, no recommendation is made for these waters. Mark Lake, also located on the Ft. Greely reservation, was found devoid of fish life and suitable for introduction of trout. Recommendations for stocking were made, and the lake was subsequently stocked with rainbow and silver salmon.

Other lakes surveyed in the Delta area were Lost Lake, Volkmar Lake, Fielding Lake and West Craig Lake. Lost Lake was found devoid of fish life and unsuitable for introductions due to insufficient depth. West Craig Lake, although of marginal depth, did not contain fish and was recommended for an experimental plant of rainbow. Both Fielding and Volkmar Lakes have acceptable natural fish populations which are summarized in Table 4.

Brooks Range Area

A trip to the Brooks Range was taken, aided by military aircraft and personnel. Nine lakes were surveyed and their fish populations were assessed by hook and line and visual observations.

The north slope lakes, draining into the Beaufort Sea (Fish Lake, Chandler Lake, Little Chandler Lake, Round Lake,

Shainin Lake and Nanushuk Lake), were similar in fish species composition and relative size. Lake trout ranged from 2 to 18 pounds, Arctic char 1-1/2 to 6 pounds, grayling 14 to 18 inches. The only notable exception was Shainin Lake, where no char were taken. It was undetermined if char exist in the Anaktuvuk River drainage. Round whitefish were present in the lakes throughout the area.

Three south slope lakes, draining into the Kobuk River system (Walker, Helpmejack and Iniakuk), were investigated. The average size of lake trout was somewhat larger in these waters and northern pike were found throughout, ranging in size from 2 to 5 pounds. Char were not taken in these three lakes and it was undetermined if they are indigenous to the lakes of the Kobuk system.

The maturity of the lake trout was of interest, as they were ripe and appeared capable of spawning as early as August 15 to 20. Lake trout scales were taken for age-growth comparison with other Interior Alaska stocks.

Survey data obtained from the Brooks Range lakes was fragmentary, lacking depths of the deeper lakes and lacking total fish species composition.

The fathometer used was unable to record depths in several of the lakes. Gillnet sampling was not conducted due to a mishap with one aircraft and the resultant difficulty in consolidating gear for survey work.

Names and locations of Brooks Range lakes are listed in Table 3.

Oxygen Tests

The 17 lakes represented in Table 5 are those checked for winter oxygen content. A number of the better-stocked waters were sampled to obtain general information and to complete the individual survey files.

Others were known to be marginal; these were checked to determine their fishing potential and the need for further survey work.

Lake Trout Transplant

Success of the 1963 adult lake trout transplant into Harding Lake appears satisfactory. Five fish were taken in a gill net sample. Their weight ranged from 3.8 to 17.8 pounds and all were in excellent condition. The fish were taken in shoal areas. All were ripe at the time of capture and appeared ready to spawn.

TABLE 5. - Lakes Tested for Dissolved Oxygen

Name	Date	Sample Depth	Ice Depth	Snow Depth	PPM Oxygen
30 Mile Pit	3-20-64	6'	36"	15"	0.0
31 Mile Pit	3-20-64	3'	30"	18"	0.0
Sergeant's Pond	3-20-64	3'	36"	14"	8.0
		12'			4.1
Donna Lake	3-25-64	6'	48"	3"	3.3
L. Donna Lake	3-25-64	12'	50"	0	6.4
		18'			4.3
Lisa Lake	3-26-64	12'	55"	4"	3.3
Little Lisa Lake	3-26-64	6'	40"	4"	2.6
		10'			2.1
Blair Lake	4-2-64	4'	50"	12"	10.0
		8'			9.5
No. Blair Lake	4-2-64	5'	50"	14"	0.0
Mark Lake	4-6-64	10'	40"	12"	5.3
		20'			4.4
Left O.P. Lake	4-6-64	8'	40"	12"	0.7
		14'			0.0
Rawhide Lake	4-7-64	5'	45"	3"	4.0
Nickel Lake	4-7-64	15'	44"	10"	6.2
		25'			1.5
"J" Lake	4-7-64	6'	43"	10"	6.5
Chet Lake	4-7-64	8'	43"	8"	6.0
Donna Lake	4-22-64	6'	45"	4"	6.5
		12'			6.4
Little Lake	4-27-64	4'	18"	12"	5.9

Further supplements to the original 1963 plant are planned for the 1965 field season.

Prepared by:	Approved by:
Larry Heckart Fishery Biologist	s/ Louis S. Bandirola D-J Coordinator
Date: April 1, 1965	s/ Alex H. McRea, Director Sport Fish Division

From the examination of fish ovaries, biologists may determine their degree of maturity and period of spawning.